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EXAMINER

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Please find below and/or attached an Office communication concerning this application or proceeding.



### **DETAILED ACTION**

Examiner acknowledges a submission of the amendment and arguments filed on April 24, 2006. Claims 16 and 32 are deleted; Claims 15, 20 and 30 are amended. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action.

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 15, 17, 18, 21, 30 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fussell (US 4,023,071) in view of Maurer (US 2,143,992) and Applicant Admitted Prior Art (AAPA). Regarding Claims 15 and 30, Fussell discloses following elements: a first overvoltage protection element (upper part of element 50 in Fig. 3) connected in a first leg of the power supply system; and a second overvoltage protection element connected in a second leg of the power supply system, the second overvoltage protection element (bottom part of element 50 in Fig. 3) being coupled to the first overvoltage protection element so that the second overvoltage protection element ignites when the first overvoltage protection element ignites and the first

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overvoltage protection element ignites when the second overvoltage protection element ignites (col. 6, lines 4 – 22).

However, it does not disclose the overvoltage protection elements having individual ignition aids connected together. Maurer discloses a plurality of the overvoltage protection elements (four sections of the element P6 in Fig. 6), each having its own ignition aid (elements E in Fig. 6) connected together. The reference has the same problem solving area, namely providing an overvoltage protection system by using spark-gap devices. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the Fussel solution by adding individual ignition electrodes to each device connected together according to the teachings of Maurer, because (I) according to AAPA (paragraph [0010]), the ignition aids lead to an improved, i.e., lower and more constant sparkover voltage, and (II) according to Maurer (col. 2, lines 35 – 42, col. 1, lines 8 - 12) connecting the igniting electrodes together results in activation of all overvoltage protecting devices when a short circuit event followed by an overvoltage is impressed on one of the tracks. Modification of Fussel solution according to teachings of Maurer will result in improved, lower and more constant spark voltage applied to the devices.

Regarding Claim 18, Fussell discloses the first and second overvoltage protection elements being disposed in a common housing (50 in Fig. 3, (col. 6, lines 4 – 22)).

Regarding Claim 33, Fussell discloses the first overvoltage protection element includes a first air breakdown spark gap (between upper and central electrodes of 50 in

Fig. 3); and the second overvoltage protection element includes a second air breakdown spark gap (between bottom and central electrodes of 50 in Fig. 3); wherein the first and second air breakdown spark gaps are disposed in a common housing so that a first plasma produced upon an igniting of the first air breakdown spark gap ignites the second air breakdown spark gap and a second plasma produced upon an igniting of the second air breakdown spark gap ignites the first air breakdown spark gap (50 in Fig. 3, (col. 6, lines 4 – 22).

Regarding Claims 17 and 21, Maurer discloses the central ignition circuit (extreme right element inside P6 in Fig. 6) connected to a first and a second ignition electrodes (elements E in Fig. 6) and the first ignition electrode cooperating with the first overvoltage protection element and the second ignition electrode cooperating with the second overvoltage protection element.

Claims 20 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fussell in view of Maurer, AAPA and Cook (US 4,683,514). As was stated above, Fussell and Maurer disclose all the elements of Claims 15 and 30. However, regarding Claims 20 and 31, it does not disclose individual ignition circuits and low voltage system. Cook discloses the ignition aid (29, 41, 33, 35, 39, 37 in Fig. 2) associated with an individual overvoltage protection element (21 in Fig. 2). Straightforward application of the ignition aid concept to multiphase system, such as shown in Fig. 3 of Fussell, protected by two individual protection elements will result in two separate ignition aids, each associated with its own protection element. Both references have the same

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problem solving area, namely providing an overvoltage protection by using the arc gap devices. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the Fussell solution by providing individual ignition aid to each of Fussell protection devices, because as Cook states (col. 1, lines 22 – 40), it is necessary to resolve a problem of protection against relatively low voltages, such lower than 300 volts. When using different ignition aid devices for triggering different protection devices associated with different phases of the power system, a timing of their firing becomes an issue (col. 6, lines 4 – 22). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have further modified the Fussell solution by connecting all triggering electrodes (37 in Fig. 2 of Cook) to a common ignition aid triggering circuit (29, 41, 33, 35 in Fig. 2 of Cook), because (I) it would reduce parts count and therefore a cost of the system, (II) according to Fussell (col. 6, lines 4 – 22), the protection devices should be triggered simultaneously since otherwise appearance of a transverse voltage across the unfired device and full protection would not be achieved.

Regarding Claim 31, Cook discloses the low voltage system. A motivation for modification of the primary reference is the same as above.

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fussell in view of Maurer, AAPA and Motoori (US 5,272,588). Regarding Claim 19, Fussell discloses following elements: the first overvoltage protection element including a first and a second electrodes (the upper terminal and the upper surface of the central

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terminal in Fig. 3) with a first air breakdown spark gap therebetween; and the second overvoltage protection element including a third and a fourth electrodes (the bottom terminal and the bottom part of the central terminal in Fig. 3) with a second air breakdown spark gap therebetween; wherein the first, second, third and fourth electrodes are disposed so that the second air breakdown spark gap ignites when the first air breakdown spark gap ignites and the first air breakdown spark gap ignites when the second air breakdown spark gap ignites due to a presence of a plasma (col. 6, lines 4 – 22). However, it does not disclose individual separated second and fourth electrodes. Motoori discloses two arc gap protection devices (114 in Fig. 3) in common housing including the first and the second electrodes (119 and 120 in Fig. 3) and third and the fourth electrodes (121 and 122 in Fig. 3) accordingly. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the Fussell solution by adding separated second and fourth electrodes to the first and second overvoltage protection elements according to Motoori, since according to Court Decision, it has been that mere duplication of the essential working parts of a device involves only routine skill in the art. See *St Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

Claims 22 - 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fussell in view of Maurer, AAPA, Motoori and Hill et al. (US 3,878,423). As was stated above, Fussell and Motoori disclose all the elements of Claims 15 and 19. However, regarding Claims 22 and 24, they do not disclose coaxially disposed electrodes. Hill et

al. disclose a surge-protecting device having the coaxially disposed electrodes with varying cross-section over a length of the electrode (84 and 82 in Fig. 5). In the Fussel system modified according to Motoori and Hill et al., both the first and the second electrodes as well as the third and the fourth electrodes will be coaxially disposed and will have respective varying cross-section over a length of the respective electrode. Both references have the same problem solving area, namely providing the surge-protecting device by using the arc gap technology. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have further modified the Fussel solution by adding the coaxially placed electrodes with varying cross section according to Hill et al., because as Hill et al. state (col. 6, lines 20 – 29, 41 – 63), such structure has advantage of minimizing the amount of sputtered material thus extending the lifetime of the device.

Regarding Claims 23 and 25, Maurer discloses individual ignition electrodes provided to each of the overvoltage protection devices. Hill et al. disclose the overvoltage protection device having coaxial electrode structure (84 and 82 in Fig. 5). In the Fussel system modified according to teachings of Maurer and Hill et al., the ignition electrodes will be positioned coaxially like all other electrodes. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have further modified the Fussel solution by adding the coaxially placed ignition electrodes with varying cross section according to Hill et al., because as Hill et al. state (col. 6, lines 20 – 29, 41 – 63), such structure has advantage of minimizing the amount of sputtered material thus extending the lifetime of the device.



Claims 26, 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fussell in view of Maurer, AAPA and Altmaler et al. (US 5,754,385). As was stated above, Fussell and Maurer disclose all the elements of Claims 15 and 18. However, regarding Claims 26 and 27, they do not disclose a housing including a lining and POM material. Altmaler et al. disclose the housing surrounding the electrodes and including a lining with POM Teflon (col. 17 – 23). Both references have the same problem solving area, namely providing high voltage protection by using the arc gap devices. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have further modified the Fussell solution by adding the housing made of lining with POM Teflon according to Altmaler et al., because as Altmaler et al. state (col. 17 – 23), such housing does not release carbon when it is heated or it burns.

Claims 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fussell in view of Maurer, AAPA and Cwirzen et al. (US 4,613,732). As was stated above, Fussell and Maurer disclose all the elements of Claims 15 and 18. However, regarding Claims 26 and 27, they do not disclose a sealed housing. Cwirzen et al. disclose the housing surrounding the electrodes and having a sealed, pressure-tight design (col. 4, lines 60 – 68). Both references have the same problem solving area, namely providing a high voltage protection by using the arc gap devices. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have further modified the Fussell solution by adding the sealed pressure-tight designed

housing according to Cwirzen et al., because as Cwirzen et al. state (col. 4, lines 63 – 68), If the protector leaks, the breakdown voltage of particular protector becomes slightly higher voltage than that of other protectors, which may cause a problem of not simultaneous ignition in different protectors.

Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fussell in view of Maurer, AAPA, Cwirzen et al. and Eldridge et al. (US 2,664,518). As was stated above, Fussell, Maurer, AAPA and Cwirzen et al. disclose all the elements of Claims 15, 18 and 28. However, regarding Claim 29, they do not disclose an outer pressure cylinder. Eldridge et al. disclose the housing having the outer pressure cylinder (11 in Fig. 1, col. 3, lines 41 – 51). Both references have the same problem solving area, namely protecting against high voltages by using arc gap devices. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have further modified the Fussell solution by adding the outer pressure cylinder according to Eldridge et al., because the cylinder is necessary (I) to mechanically reinforce the device to withstand a high pressure of gas and (II) it is used for electrically grounding the device to discharge the dynamic current to the ground (col. 3, lines 41 – 51, col. 2, lines 25 - 31).

### ***Response to Arguments***

Applicant's Arguments have been given careful consideration but they are now moot in view of a new ground of rejection.

***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zeev Kitov whose current telephone number is (571) 272 - 2052. The examiner can normally be reached on 8:00 – 4:30. If attempts to reach examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sircus can be reached on (571) 272 – 2800, Ext. 36. The fax phone number for organization where this application or proceedings is assigned is (571) 273-8300 for all communications.

Z.K.

*Stephen W. Jackson*  
6-29-06

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PRIMARY EXAMINER